

# 9 Improving the Entrance to Aransas Pass, Texas, by Natural Methods.

## Comparative Summary of Results and Cost.

Prior efforts by Government and others. *No results.* Cost, \$657,885. The "Haupt" plan, partially built, *increased depth nine feet.* Cost, \$235,000. Cost, per foot of depth gained, \$26,111, which is unprecedented.

## Comparative Propositions.

The Government proposes to build *two jetties and dredge* a 20-foot channel, which *will not be self-maintaining*; without guarantees or time limitations; with no risks as to results and with no probability of continuous appropriations to complete for **\$1,525,000.**

Prof. Haupt, if given the contract, proposes to complete his curved breakwater, now embodied in the Government plan; guarantees the channel and its maintenance by tidal scour for two years, surrenders all rights under his patents at Aransas Pass, and gives bonds for the faithful performance of his contract, for the sum of **\$500,000, thus saving at least \$1,025,000** in case the plan succeeds; but should the channel not be secured, he forfeits the final payment of \$100,000, or should it not prove to be self-maintaining for two years, \$75,000 more, thus reducing the cost of the breakwater in place to \$325,000, all of which work is embodied in the Government plan, so that *it would lose nothing.* The bond of \$50,000 is given to protect the Government from any damages for failure to fulfil conditions of contract.

## Equities.

The inventor of this plan has a deep professional interest in the proper conduct of the work; his bill safeguards the Government fully and he proposes to prosecute the plan vigorously to completion. On the other hand, if these plans are relegated to unfriendly

parties to be executed, it will cost more, take longer to finish, will not release the Government from claims for infringement of patent rights, and may be entirely defeated by an improper order of construction or failure to remove the obstructing jetty.

The work has already been under the Government control for about three years, with an appropriation specifically made for the removal of the old jetty, which has not been done.

### **The Value of the Work.**

The Report of the Board of Engineers, dated November 22nd, 1897, states :

“The value to the Government of the works of the Aransas Pass Harbor Company for the improvement of Aransas Pass, Texas, is nothing.”

Up to the date of the abandonment of this Pass by the Government in May, 1889, it had expended \$550,416.58 without material improvement, while the Harbor Company subsequently expended \$235,000 on the north jetty, which at the date of the report had deepened the channel from  $6\frac{1}{2}$  to  $9\frac{1}{4}$  feet,\* and it has since continued to deepen without assistance or further work, to  $15\frac{1}{2}$  feet, at which depth the channel is held by the remains of the old, rock-covered jetty, built by the Government and reported as having “disappeared.”

The Government's revised estimate for securing 20 feet by two jetties and dredging in 1889 (vide reports of Chief of Engineers) was \$2,054,343.72, and in 1898 (Doc. 119, H. R., 55th Cong., 3rd Ses.) it was \$1,525,000.00, showing a reduction of \$529,543.72 due to the results secured by the works of the Harbor Company, which were reported to be of no value.

Prof. Haupt, the inventor of the curved breakwater which has produced these unprecedented results, has proposed to Congress to complete his work and to guarantee the channel for \$500,000, thus saving the further sum of \$1,025,000, and he further agrees to maintain the channel for two years by tidal scour without charge, or forfeit \$75,000 as a demonstration of the great value of the device,

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\* Document 137, H. R., 55th Cong., 2nd Session.



even under such adverse circumstances. He further surrenders all claims for royalties at Aransas Pass in case he is permitted to complete his breakwater at that place.

### **Physical Results of the Work.**

This report also states that in the opinion of the Board,—

“There does not seem any probability that the jetty as now constructed will of itself secure and maintain any considerable increase of depth in a navigable channel of proper width.”

(Vide Page 15, Document 137, H. R. 55th, Cong., 2nd session.)

On the contrary, the results have shown how little the operations of the curved jetty were understood by the Board, since this incomplete structure, without any additions or aid from dredging, has caused the removal by scour of over half a million cubic yards of material, has increased the depth of the channel nine feet, at the shoalest point, has maintained and fixed the channel in position and has deteriorated less than most jetties, notwithstanding its incomplete condition, both as to length and capping. It has not been undermined nor is there even a trough near its base, while the maximum depth shown\* was  $25\frac{1}{4}$  feet.

All this without cost to the Government, since this is the result of the work done by private parties and turned over to the Government three years ago on condition of its being completed at once.

This progressive deepening, widening and maintenance is now arrested by the presence of the old Government jetty. Such a result is believed to be unparalleled in the annals of harbor improvements, and it has been crowned by the highest premiums from the learned societies.

### **The Obstructing “Old Government Jetty.”**

This jetty was built between February, 1881 and April, 1885. In the Report of the Chief of Engineers for 1882, page 1314, it is said: “The work designed to deepen the channel over the bar was a jetty on the south side of the entrance. It was con-

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\*Vide the official Chart of the Survey of 1900.

structed upon a line running east and west to a point 2,352 feet from the shore, where it curved northward upon a radius of 2,880 feet and extended 1,698 feet further, making a length from shore of 4,050 feet.

\* \* \* \*

It was constructed of superposed mattresses ballasted with stones. \* \* It appears that the curved portion of the jetty has practically disappeared. Of the straight portion \* \* \* that which was built out into the Gulf has its crest, upon an average, about three feet below mean low tide. \* \* Its height above the bottom has diminished about 6.2 feet, or over 50 per cent. \* \* \* The effect of the work upon the bar has been insignificant."

The expenditure for this experience was \$393,556.95 to July, 1887.

As the work of the Harbor Company proceeded, the current scour soon revealed the existence of this obstructing jetty lying across the entire channel so that it limited the depth, and as it was not anticipated, due to the report quoted above, no contract had been made for its removal.

When the work was returned to the Government in 1899 it immediately appropriated \$60,000 for the removal of the old jetty "in such manner as to in no wise interfere with the curved jetty now located in said harbor."

A contract was let in accordance with the terms of this act, but no work was done and after 13 months had elapsed it was annulled.

A careful survey with borings was made of the old jetty, and upon it the opinion was expressed that "It was not acting as an obstruction." (See Report, Chief of Engineers for 1901, page 1952.) The drawing was "not printed" but it shows very clearly that this old jetty is still in place, covered with rock extending entirely across the channel at depths of from 11 to 15½ feet. It is therefore an absolute barrier to the creation of the proposed 20-foot channel or to the further deepening of the present improved one and yet, in consequence of these representations, authority was obtained to permit it to remain and to apply the money appropriated for its removal to the part of the jetty which was not to be interfered with under the law, with the result that the work now under contract is



causing shoaling and bar advance, so long as the jetty remains and the outer end of the breakwater is incomplete.

Thus all efforts to secure the removal of this serious obstacle to the creation of the channel by scour have been thwarted, and it remains a barrier to commerce as well as a bar to the demonstration of the complete practicability of the reaction breakwater.

### **Other Barriers.**

In a recent communication to the Chairman of the Rivers and Harbors Committee, from the office of the Chief of Engineers, occur these statements:—

“The Government jetty contemplates an apron of stone along entire length of jetty, 18 feet wide, 3 feet thick, which is not a part of the Haupt plan, and requires about 17,000 tons of stone.”

A reference to the original plans of the Haupt jetty, as published in the official report, Doc. 137, would have avoided this error, as the apron of the full dimensions is there shown as it was built and from which that in the Government plan is copied. (See same document.) It is also stated that, “The Government plan contemplates a sill from the end of jetty to shore, etc.”

If this sill be built, it will defeat the purpose of the breakwater by cutting off a large portion of the only force available for scour, and ultimately require a second jetty and dredging to secure and maintain the channel, so that it would be a fatal mistake, as there is no injury to the physical conditions by leaving it open for the free admission of the tides. This is fundamental to success.

### **Argument Against Haupt's Plan by the Engineers.**

Again it is stated: “The Haupt jetty on Government plan will cost \$575,000, including sill and apron.”

Such sill and apron are estimated to cost \$94,250 by the engineers at an assumed unit price, which is less than the present contract price. The letter is a criticism of Haupt's bill for deepening channel at Aransas Pass, and this statement is a comparison of cost of work under his bill and work if left in hands of engineers.

It seeks to show that there is no "apron" in Haupt's plan, which is erroneous; also, that a "sill" is needed. Although a sill is no part of the Haupt design, and would defeat its purpose, and that if the cost of sill and apron, \$94,250, is deducted from their estimate with sill and apron, they will do as much with \$480,750, as Haupt with \$500,000.

This is in no sense a fair comparison. For they say Haupt's Breakwater will not get the 20-foot channel and offer a plan at a cost of \$1,525,000, which they say will get the water by aid of dredging. Haupt says his device will get such channel, and maintain it without artificial aid for two years at a total cost of \$500,000, and agrees to forfeit \$75,000 if it is not thus maintained. He also forfeits last \$100,000 to be paid for breakwater if full 20 feet, 150 feet wide is not procured. He is paid, therefore, for *merely* building of breakwater, but \$325,000, which should be their basis of comparison with their estimate of \$480,750, without sill or apron, assuming, as they do, that neither Haupt's nor their construction of breakwater, unaided, will get the water.

The comparison, however, should be between their estimate of \$1,554,423.72, which they say *should* get the water by dredging and jetties, and Haupt's \$500,000, which he believes, as shown by local physical condition, *will* get the water, and any other basis can have but one effect, namely, to cloud the real issues.

To be entirely fair, comparison should be stated thus:—

Expended by U. S. engineers, without results, up					
to 1890 (on 12 ft. project)	-	-	-	-	\$ 550,416 58
Their revised estimate for 20 ft.	-	-	-	-	2,052,543 72
					<hr/>
					\$2,602,960 30
Spent by A. P. H. Co. on north jetty					
(gain, depth 9 ft.)	-	-	-	\$235,000 00	
Bid by Prof. Haupt to complete	-			500,000 00	
				<hr/>	735,000 00
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Difference saved had Haupt plan been available					
from the start	-	-	-	-	\$1,867,960 30



## **Brief of L. M. Haupt and Associates to Improve Aransas Pass, Texas, for \$500,000, which is Less than One-third of the Estimated Cost by the Government Plan.**

The proposal is to create a channel and to maintain it for two years by the natural scour from the tides, having a width of 150 feet bottom, and a depth of 20 feet over this width, entirely across the bar, by means of a single curved or Reaction Breakwater of stone, of sufficient dimensions to control the currents but not oppose too great superficial resistance to waves, for the sum of \$500,000.

The work is to begin within three months and the channel is to be secured within three years or he shall forfeit \$175,000 of the above amount, and he shall also file a bond of \$50,000 for the faithful performance of the contract.

The work shall be done under the Secretary of War and the payments be duly certified by an experienced Government official in his department, to be designated by him.

In consideration for this contract, the said Haupt shall surrender all his patent rights to this improvement at Aransas Pass and make no claim for its use or for damages. He shall further remove the obstructing old Government jetty and complete the breakwater as designed for the Aransas Pass Harbor Company in 1895.

He shall take all risks, and in case of failure to commence or to continue the work as specified, he shall forfeit it and his penalties without delay and the work shall be continued by the Government.

The Rivers and Harbors Committee being unanimously in favor of completing the Haupt plan, proposes the following item:

“Improving Aransas Pass, Texas.

“Continuing improvement, two hundred and fifty thousand dollars: *Provided*, That the work at this harbor shall be confined to the completion of the north jetty in accordance with the design and specifications of the Aransas Pass Harbor Company, and in continuation of the work heretofore carried out on said jetty by said company, and to such additional work as may be necessary for strengthening such jetty, and for the removal of such part of the

old Government jetty and any other hard material which may interfere with the formation of a channel by the natural action of the currents."

### **Objections to Present Form of Item.**

Under this provision of the House Bill the work is transferred to those who have persistently opposed it as of no value and who have predicted its failure, to be executed, with an amount not half large enough to complete, and with the probability that it may be expended in injuriously enlarging the dimensions without producing additional scour, with no responsibility for results and no limitations as to the time within which the work shall be commenced or completed. Neither is there any guarantee that the obstructing Government jetty, which has been reported to be no obstruction after Congress had directed its removal and made an appropriation therefor, will be sufficiently removed nor that the work will be prosecuted in such order as to produce scour instead of deposit, nor that the admission of the flood-tide upon which the scour depends will not be seriously restricted by the proposed sill, embodied in the Government plan and constituting part of its north jetty, any or all of which would prove injurious if not disastrous to the Haupt plan and ultimately involve the further expenditure of more than \$1,000,000 in a second jetty and for dredging and further sums for maintenance which are not provided for in this bill.

It is therefore proposed to request the Senate Committee on Commerce to accept Professor Haupt's proposition as being reasonable, safe, equitable and in the interest of the public service.